ABSTRACT OF THE DISCLOSURE

The present invention discloses eight new reduced dimensionality (RD) triple resonance nuclear magnetic resonance (NMR) experiments for measuring chemical shift values of certain nuclei in a protein molecule. The RD 3D HA,CA,(CO),N,HN NMR experiment and the RD 3D H,C,(C-TOCSY-CO),N,HN NMR experiment are designed to yield "sequential" connectivities, while the RD 3D $H^{\alpha\beta}$,$C^{\alpha\beta}$,CO,HA NMR experiment and the RD 3D $H^{\alpha\beta}$,$C^{\alpha\beta}$,N,HN NMR experiment provide "intraresidue" connectivities. The RD 3D H,C,C,H-COSY NMR experiment, the RD 3D H,C,C,H-TOCSY NMR experiment, and the RD 2D H,C,H-COSY NMR experiment allow one to obtain assignments for aliphatic and aromatic side chain chemical shifts, while the RD 2D HB,CB,(CG,CD),HD NMR experiment provide information for the aromatic side chain chemical shifts. In addition, a method of conducting suites of RD triple resonance NMR experiments for high-throughput resonance assignment of proteins and identification of the location of secondary structure elements are disclosed.